“Express” Water Wagon
“Express” Water Skid
Fire Control Wagon
Arena Express Water Wagon

Operator’s & Parts Manual

7-15-15 01-027R15

Printed In The USA — Specifications & Design Subject To Change Without Notice!

Warranty Information

A Message To The Owner And Operator

This equipment was carefully designed and manufactured to give you dependable service. To insure efficient operation of this equipment, please read this operator's manual carefully. Check each item and acquaint yourself with the adjustments required to maintain optimum performance and operation. ***Remember, this equipment's performance depends on how you operate and care for it!***

At the end of each season, thoroughly clean and inspect your equipment. Preventive maintenance saves time and pays dividends. Your nearest Wylie Spray Center has original equipment parts which assure proper fit and best performance. Record your equipment's model and serial numbers and the date you purchased this equipment in the space below. Have this information available when you order parts or attachments.

Model Number: _____

Serial Number: _____

Date Purchased: _____

Limited Warranty

This is a limited warranty. It covers products manufactured by WYLIE Mfg. Co. The Warrantor is **WYLIE Mfg. Co., 702 E. 40th St., Lubbock, Texas 79404 USA**. The duration of the warranty for WYLIE manufactured equipment and products (excluding polyethylene tanks) is for **one year from date of delivery to the carrier.** The Warrantor warrants to the Buyer that the product(s) sold hereunder are free from defects to material and workmanship, under normal use and service, in the hands of the original buyer.

If goods are defective, the defective goods will be replaced with identical goods. If identical goods are not available, the Buyer may elect to receive a refund of the purchase price for the defective goods, or the Buyer may order similar goods. **The damage for defective goods shall not exceed the purchase price of the defective goods. No allowance shall be made for labor or expense or repairing goods without prior approval in writing by the Warrantor.** The Buyer's remedy under this warranty does not include incidental or consequential damages.

For products not manufactured by the Warrantor, the Warrantor warrants these products to the extent of the warranties of their respective manufactures. **There are no warranties which extend beyond this limited warranty, including the implied warranty of merchantability.** Dealers or representatives shall not make any representation in regard to particular goods except as authorized by the Warrantor through a written warranty accompanying those particular goods.

Disclaimer of Warranty

WYLIE Mfg. Co., and its divisions, "Wylie Spray Centers," in each location, requires as a condition of sale and coverage by its LIMITED WARRANTY that all equipment sold by it be used in accordance with the instructions and specifications of the Warrantor. This requirement is in addition to the LIMITED WARRANTY.

Polyethylene and fiberglass tanks – These tanks are warranted for the storage and transport of water, herbicide solutions (on farm), liquid fertilizer and liquid feed. Such tanks should not be used for the storage of any bulk herbicide (undiluted). Any such use will render this warranty void.

In addition, the Warrantor makes no warranty with regard to bulkhead tank fittings used in connection with tanks containing bulk herbicides and the use of any such fittings sold by the Warrantor or any WYLIE dealer in connection with tanks containing bulk herbicides is improper.

Chemical Incompatibility – The Warrantor does not make any recommendations or warranties regarding chemical compatibility. WYLIE shall not be liable for any damages due to chemical incompatibility, and any Buyer or user should rely solely on written information furnished by the chemical manufacturer regarding chemical compatibility.

No employee of WYLIE Mfg. Co., or its representatives, agents or dealers, is authorized to vary the terms of this limited warranty.

Wylie Manufacturing Company
702 E. 40th St.
Lubbock, TX 79404
Ph. 888-788-7753

"Express" Water Wagon or Skid

Date of Purchase		
Model Number	Type of Applicator: ☐ Express ☐ Arena ☐ Fire Control	
Frame Serial Number		
Tank Serial Number	Trailer Capacity ☐ 500 ☐ 1,025 ☐ 800 ☐ 1,600	
Wylie Invoice Number		
Owner's Name		
Address	Skid ☐ 500	
City	State	Zip
Phone		
Email		
Dealer		

Owner's Signature

Must be returned within 10 days to validate the warranty.

-- Or Register Online --
Go to: www.wyliesprayers.com

Table Of Contents

Safety Issues ..... 2 - 3

Reporting Safety Defects 3

Safety Decals & Placement ..... 4 - 6

Introduction 7

Inspection & Setup ..... 8 - 9

Operation - “Express” Water Wagon ..... 9 - 12

- Fire Control Trailer ..... 13 - 16

- Arena Express Water Wagon ..... 16 - 18

Maintenance, Lubrication ..... 18 - 19

Tip Chart 19

Troubleshooting Guidelines 20

Tire Safety Information ..... 21 - 31

Repair Parts ..... 33 - 55

Express Water Wagons ..... 34 - 47
- 500 Elliptical Trailer Assembly 34
- 800 Gallon Trailer Assembly 35
- 1,025 Gallon Trailer Assembly 36
- 1,600 Gallon Trailer Assembly 37
- Axles & Hubs 38
- Lighting 39
- Trailer Pump & Plumbing 40
- Suction Plumbing 41
- Spray Bar Assembly 42
- Skid Assembly 43
- Skid Pump & Plumbing ..... 44 - 45
- Suction Kit, Fire Hose, Side Watering Kit , Anti-Siphon Fill Kit, Garden Hose ..... 46 - 47

Fire Control Trailers ..... 48 - 51
- 500, 800 Gal. Trailer Assembly 48
- 1,025 Gal. Trailer Assembly 49
- Torsion Axles 50
- 1,025 Gal. Fire Control Plumbing 51

Arena Express Water Wagons ..... 52 - 53
- 500, 1,025 Gal. Trailer Assembly 52
- Arena Express Plumbing 53

Tsurumi Pump 54

Banjo Pump 55

Safety Precautions

Be alert when you see the above symbol in the manual. It warns of a hazard which might lead to injury. It means: *Attention! Become alert! Your safety is Involved!*

Three (3) words (Danger, Warning, and Caution) are associated with this symbol.

DANGER – Indicates a hazardous situation, which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

WARNING – Indicates a hazardous situation, which, if not avoided, could result in death or serious injury.

CAUTION – Indicates a hazardous situation, which, if not avoided, may result in minor or moderate injury.

NOTICE – Indicates information considered important, but not hazard-related (e.g., messages relating to property damage).

SAFETY INSTRUCTIONS - Indicates a type of safety sign where specific safety-related instructions or procedures are described.

Before Use

Do not operate trailer until this manual has been read and understood!

- Thoroughly read and understand all instructions before operating this trailer. If you have questions, please contact ***Wylie Manufacturing, 702 E. 40th St., Lubbock, TX 79404, (888) 788-7753.*** You can also contact your nearest ***Wylie Spray Center***.
- Make sure that the trailer is properly attached to the tow vehicle, including lights, safety chains, hitch and breakaway brake cable.
- Check lug bolts for tightness and tires for wear.
- Adjust hitch height as needed to assure that trailer is level when fully loaded.
- Always wear safety goggles, chemical resistant apron and rubber gloves when handling chemicals.
- Read and understand the chemical manufacturer's safety guidelines on handling, mixing and application.

During Use

- Do not allow anyone to ride on trailer during operation. Falling can cause injury or death.
- Reduce speed when crossing uneven or rough terrain.
- Always turn off tow vehicle engine before making adjustments or repairs to an attached trailer.

After Use

- Inspect trailer for wear or damage.
- Ensure that all fasteners and fittings are tight.
- Flush tank and pump with fresh water if chemicals are used. Dispose of flush water using appropriate means.
- Carry out maintenance and/or lubrication procedures as outlined in this manual.

Always

- Keep hands, feet and clothing away from moving parts.
- Wear protective clothing and gloves when working with chemicals.
- Assure that the hitch is attached to the proper size ball.
- Attach the safety chains and breakaway brake cable to the tow vehicle.
- Plug the lights into the tow vehicle.

Operator's Instructions

- When possible, avoid operating the tow vehicle near ditches, embankments and holes.
- Reduce speed when turning, crossing slopes and on rough, slick or muddy surfaces.
- Do not permit others to ride.
- Operate tow vehicle smoothly – no jerky turns, starts and stops.
- Hitch only to the hitch points recommended by the tow vehicle manufacturer.
- When tow vehicle is idle, engage brakes and park lock securely.
- Tighten lug bolts before transporting the first time and maintain proper torque.
- Check lights and wiring daily. Service and replace to maintain proper operation.

Wylie Manufacturing, 702 E. 40th St., Lubbock, TX 79404

Reporting Safety Defects

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Wylie Manufacturing.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Wylie Manufacturing.

To contact NHTSA you may either call the Auto Safey Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153); go to http://www.safercar.gov; or write to:

NHTSA
U. S. Department of Transportation
12000 New Jersey SE
Washington, DC 20590

You can also obtain other information about motor vehicle safety from the http://www.safercar.gov.

Safety Decals & Placement

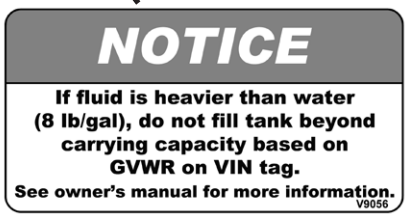
"Express" Water Wagon

WARNING
DOT Approved For
Non-Flammable & Non-Hazardous
Materials Only
Transporting flammable or hazardous materials in this trailer may be dangerous and unlawful.

Decal #V9020

SAFETY CHECKLIST
Do not operate this trailer without checking the following list.
✓ Coupler and ball must be same size.
✓ Coupler must be locked.
✓ Safety chains must be crossed beneath hitch and attached to truck.
✓ Breakaway brake cable must be attached to truck.
✓ Trailer lighting must be operating properly.
✓ Jack must be retracted.
✓ Wheel lug bolts must be properly tightened.
✓ Brakes must be properly adjusted.
V9029

Decal #V9029


NOTICE
If fluid is heavier than water (8 lb/gal), do not fill tank beyond carrying capacity based on GVWR on VIN tag.
See owner's manual for more information.
V9056

Decal #V9056

Contact us at mail@wyliesprayers.com or 888-788-7753 to order safety decal or manual replacements.

Safety Decals & Placement

Fire Control Trailer

Decal #V9048

Decal #V9029

WARNING
DOT Approved For Non-Flammable & Non-Hazardous Materials Only
Transporting flammable or hazardous materials in this trailer may be dangerous and unlawful.

Decal #V9020

Contact us at mail@wyliesprayers.com or 888-788-7753 to order safety decal or manual replacements.

Safety Decals & Placement

Arena Express Water Wagon

Decal #V9048

Decal #V9019

WARNING
DOT Approved For Non-Flammable & Non-Hazardous Materials Only
Transporting flammable or hazardous materials in this trailer may be dangerous and unlawful.

Decal #V9020

Contact us at mail@wyliesprayers.com or 888-788-7753 to order safety decal or manual replacements.

500 Gal. "Express" Water Wagon

800 Gal. "Express" Water Wagon

500 Gal. Fire Control Trailer

1,025 Gal. Arena Express Water Wagon

500 Gal. "Express" Water Skid

Introduction

The Wylie "Express" Water Wagon and Skid are the result of years of testing and field proven experience. They are built of the finest materials and expert workmanship to provide you with years of reliable service. The "Express" Water Wagon is a DOT approved trailer with a 500, 800, 1,025, or 1,600 gal. tank. Features include a Tsurumi transfer pump powered by a Honda engine, spray bar, fire hose and nozzle, discharge and suction manifold, lights, brakes and fenders. The "Express" Water Wagon is designed for many uses such as dust abatement, construction site preparation, remote watering, and concrete saw lubrication.

The "Express" Water Skid features a 500 gallon elliptical tank as well as the same pump, motor, spray bar, fire hose and suction manifold found on the Water Wagon. All of the functions of the "Express" Water Skid are very similar to the Water Wagon and can be easily adapted from the instructions in this manual.

The Fire Control Trailer is a non-DOT approved trailer available with a 500, 800, or 1,025 gallon black opaque tank. The Fire Control Trailer is equipped with a spray bar and fire hose. It is designed for fighting grass, hay or cotton gin fires as well as controlling dust.

The Arena Express Water Wagon is a non-DOT approved trailer available with a 500 or 1,025 gallon tank. It is designed to control dust in arenas, stalls and alleys. It is useful for trailer wash-out and controlling a hay or grass fire.

This manual explains where and how to make necessary adjustments to your "Express" for safe and proper operation. Thoroughly read and understand the contents of this manual before operating your sprayer. If you have questions or do not understand particular items, contact your nearest Wylie Spray Center or call Wylie Manufacturing at (888) 788-7753. Please keep this manual handy to answer questions you may have as they arise.

Pay Particular Attention To All Safety Suggestions **–** Their purpose is to assure safe operation of the sprayer and prevent injury or damage to yourself or the unit.

Inspection & Setup

Your “Express” Water Wagon, Fire Control Trailer, and Arena Express Water Wagon is delivered ready for operation. However, it is suggested that you check fasteners for tightness such as lug nuts. Check the motor to assure that it has the proper oil level (see the motor operator’s manual for details). Make a visual inspection to assure that nothing was damaged in shipping. Report any problems to your dealer or to Wylie Mfg.

Attaching To Pickup

⚠ WARNING ⚠

Check to make sure that the ball and hitch are the same size. Attaching a 2 5/16” hitch to a 2” ball could allow the trailer to become unhitched during transport resulting in serious bodily injury.

“Express” Water Wagon & Fire Control Trailer

The 500 gallon trailer is equipped with a 2” hitch while the 800, 1,025, and 1,600 gallon trailers are equipped with a 2 5/16” hitch. Make sure that the pickup or tractor has the proper ball. Engage the locking trigger and rotate the hitch lock to open the hitch. Lower the hitch on the ball. Close the hitch by rotating the hitch lock until it locks in place.

Attach the safety chains and plug in the lights. **DOT regulations require that the safety chains cross as they are attached.** Surge and electric brake trailers have an emergency brake cable that activates the trailer brakes if the trailer becomes unhitched from the pickup while travelling. Hook the brake cable to the safety chain eyelet.

Figure A1
Attaching Express Water Wagon To Pickup

The “Express” Water Wagon is equipped with a height adjustable hitch. Remove the bolts and move the hitch so that the trailer will travel level when the tank is full.

The bolted hitch can be removed to help prevent theft of the trailer.

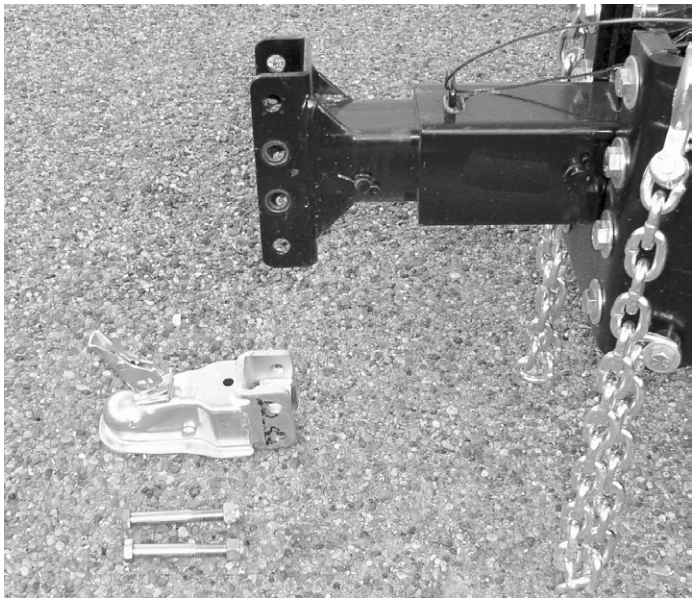


Figure A2
Remove Hitch To Prevent Theft

Arena Express Water Wagon

The Arena Express Water Wagon is equipped with a clevis style hitch. The hitch can be removed to help prevent theft. The Arena trailer is a non-DOT approved trailer. It is not equipped with brakes or lights.

Figure A3
Attaching Arena Express to Pickup

The Arena Express is equipped with a ratchet valve to control the spray bar. Tie a rope through the ratchet valve handle with enough length to reach the tractor seat.

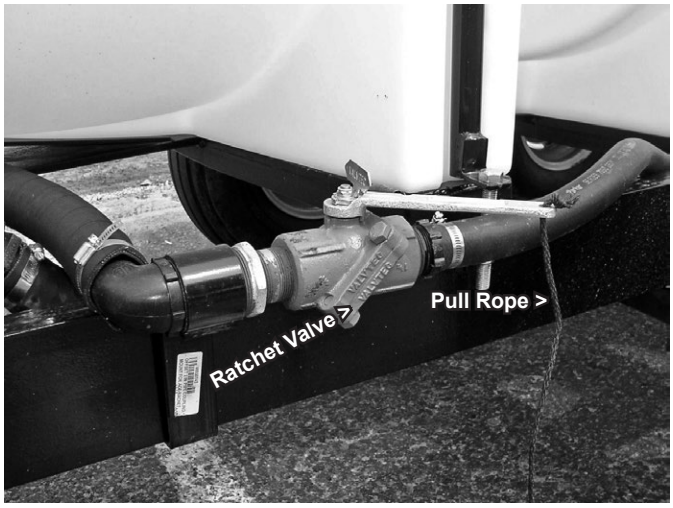


Figure A4
Arena Express Ratchet Valve & Pull Rope

The "Express" is equipped with cam-lock caps over the quick couplers. They must remained locked in place except when attaching a suction hose. The caps are secured with pins as shown in Figure A5.

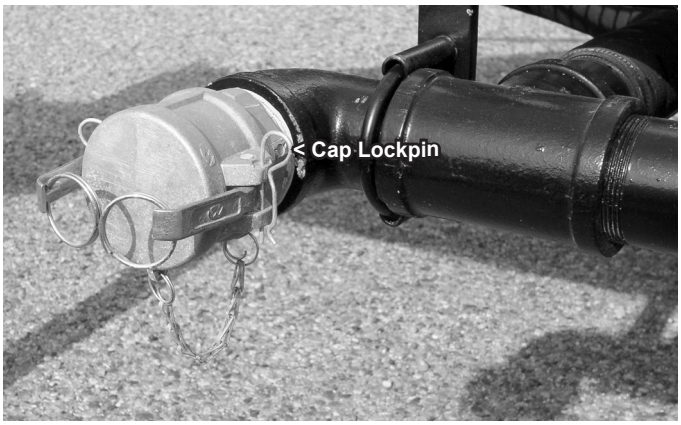


Figure A5
Coupler Cap Lockpins

Operation -- "Express" Water Wagon

The "Express" Water Wagon features a suction and discharge manifold. The suction manifold contains the valves and fittings for filling the tank, supplying the pump and a gravity feed faucet. The discharge manifold has valves controlling the bypass, fire hose, pressure hose and spray bar.

Note: Open the ball valves by turning the handle parallel to the flow. Close the valve by turning the handle perpendicular to the flow.

Figure B1
Water Wagon Suction and Discharge Manifolds

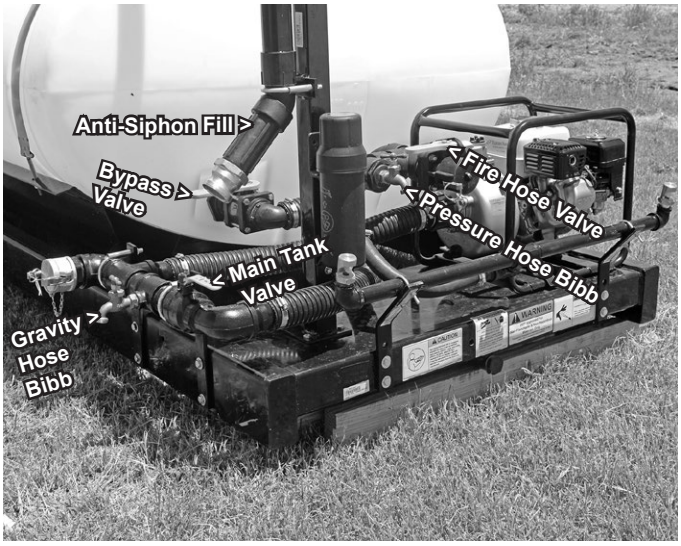


Figure B2
Water Skid Valves

Filling The Tank

The water tank on the "Express" Water Wagon can be filled by three means: (1) through the anti-siphon fill tube (2) drawing water through the pump (3) through the quick-fill fitting.

To fill the tank through the anti-siphon fill, remove the tank lid, couple the fill hose to the anti-siphon coupler and turn the water source on as shown in Figure B3. A fire hydrant adapter is provided that couples to the end of the fill hose.

Figure B3
Filling Tank Through Anti-Siphon Fill

If the tank is to be filled through the quick-fill fitting, couple the hose to the quick-fill coupler as shown in Figure B4. Open the main tank valve, then open the water source.

Figure B4
Filling Tank From Pressurized Source

In order to fill the tank with the transfer pump as shown in Figure B5, close the main tank valve and attach the fill hose to the suction manifold quick-fill coupler. Open the bypass valve on the discharge manifold. Set the end of the fill hose in the pond, tank or other water source with the suction screen coupled to the end of the hose. See Figure B5. Be sure that the suction hose bibb is closed. A partially open hose bibb will let air into the suction manifold, causing cavitation in the pump and not build pressure.

Figure B5
Filling Trailer From Tank

Start the engine to pump water from the water source to the tank. If this is the first time to use the pump, it may be necessary to pour water in the top of the pump to prime it. Once the pump has water in it, it is self-priming thereafter.

Bypass Valve

The bypass valve is located on the discharge manifold and is useful for filling the tank through the pump, circulating water through the tank when the pump is turned on but no water is being discharged, and mixing any chemicals that are added to the water.

Figure B6
Open Bypass Valve

Spray Bar

The Spray Bar is controlled by the spray bar valve. Open the main tank valve and close the bypass valve.

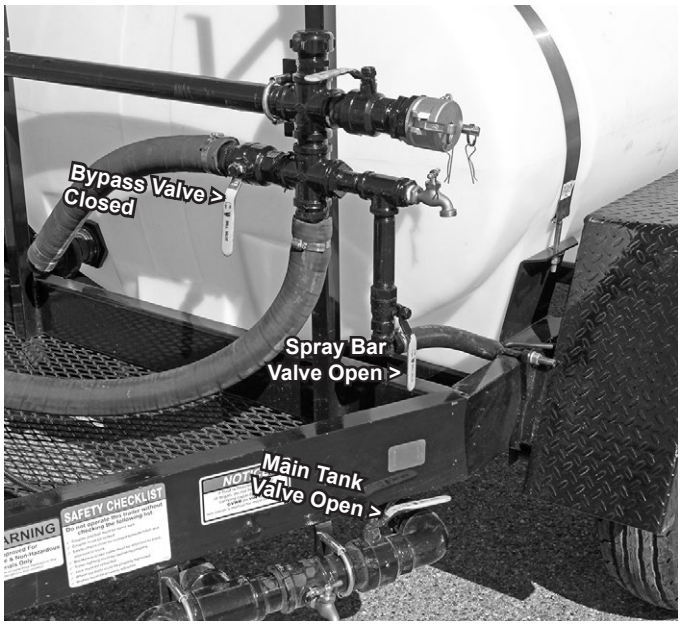


Figure B7
Spray Bar Valve

Start the engine and increase to full throttle. Open the spray bar valve. Use the pickup speed to control the rate that water is applied. The amount of water flowing through the spray bar can be controlled by partially closing the spray bar valve or slightly opening the bypass valve. Do not close the main tank valve. Pump damage can result.

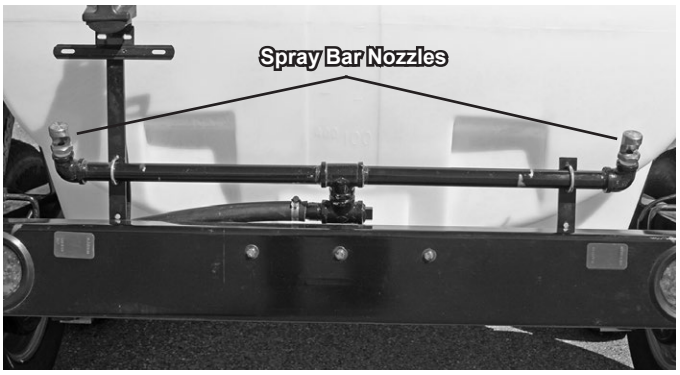


Figure B8
Spray Bar Nozzles

The spray bar covers a maximum swath of 25'. Common uses include controlling dust on roads and parking lots, compacting roads and building sites.

Figure B9
Operating Spray Bar

Fire Hose

⚠ WARNING ⚠

Do not direct the spray from the fire hose or pressure hose at electrical connections, boxes or lines. Electrical shock could cause serious bodily injury or death.

The 25' fire hose couples to the fire hose valve on either side of the trailer. Remove the fire hose coupler cap and quick couple the fire hose. Open the main tank valve, close the bypass and spray bar valves. Open the fire hose valve on the side that the hose is attached. The fire nozzle adjusts from wide spray to straight stream by rotating the body of the nozzle.

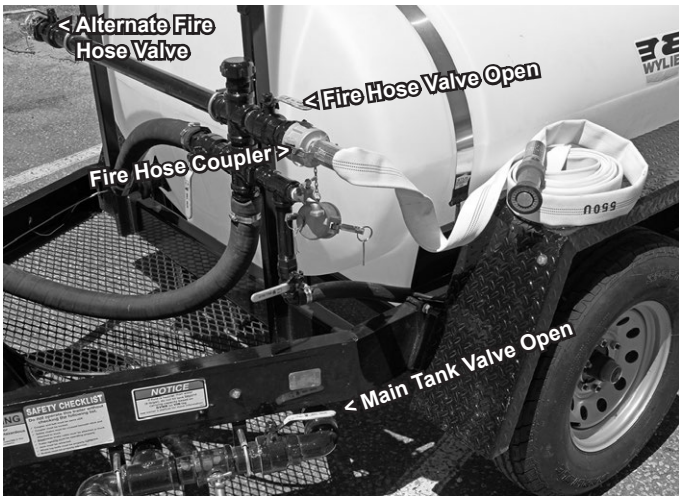


Figure B10
Fire Hose Connection

The fire hose and nozzle can be used for spot watering to control dust and compact building sites. Other uses include watering remote landscape and fighting grass fires.

Figure B11
Operating Fire Hose

Side Watering Nozzle

The discharge manifold can be fitted with an optional side watering nozzle. Quick couple the nozzle to the fire hose coupler and open the fire hose valve.

Figure B12
Side Watering Nozzle

Pressure Hose

To operate the pressure hose, attach the pressure hose to the pressure bibb, open the main tank valve and start the engine. All of the ball valves on the discharge manifold should be closed. Open the bibb and engage the trigger gun.

Figure B13
Pressure Hose Watering

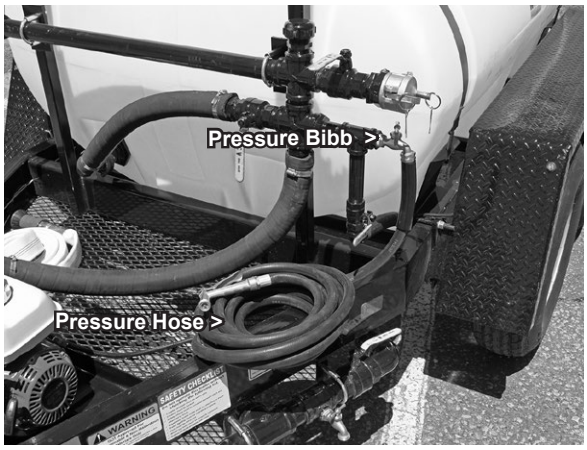


Figure B14
Pressure Hose Connection

Suction Manifold Bibb

A second bibb is located on the suction manifold and is useful for gravity feeding water to concrete saws and other low volume applications. With the engine turned off, attach the pressure hose to the gravity bibb and remove the trigger gun. Open the main tank valve and the gravity bibb. The outlet of the hose must be lower than the level of the water in the tank for the water to gravity flow through the hose.

Figure B15
Gravity Flow Hose Connection

Operation -- Fire Control Trailer

The 500 and 800 gallon Fire Control Trailers feature a suction and discharge manifold. The suction manifold contains the valves and fittings for filling the tank, supplying the pump and a gravity feed faucet. The discharge manifold has valves controlling the bypass, fire hose, pressure hose and spray bar.

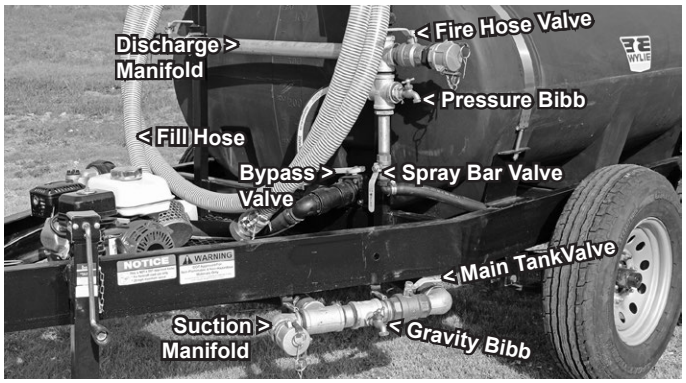


Figure B16
500/800 Gallon Fire Control Trailer Valves

The 1,025 Fire Control Trailer is equipped with a quick-fill and bypass system as well as a fire hose and spray bar.

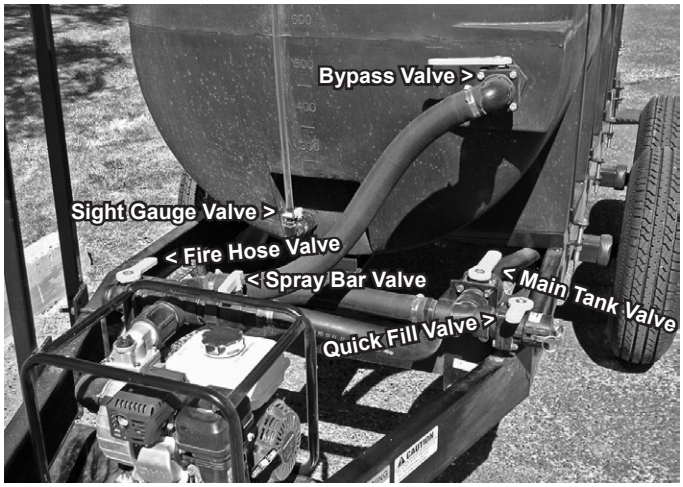


Figure B17
1,025 Gallon Fire Control Trailer Valves

Note: Open the ball valves by turning the handle parallel to the flow. Close the valve by turning the handle perpendicular to the flow.

Filling The Tank

The water tank on the Fire Control Trailer can be filled by three means: (1) through the tank fillwell (2) through the quick-fill fitting (3) drawing water through the pump.

Before filling through the fillwell, check local codes to see if it is lawful to insert a hose or tube into the tank. If not, an optional fender and anti-siphon fill kit are available.

If the tank is to be filled through the suction manifold/quick-fill fitting, couple the hose to the quick-fill coupler as shown in Figure B17/18. Open the main tank valve, then open the water source.

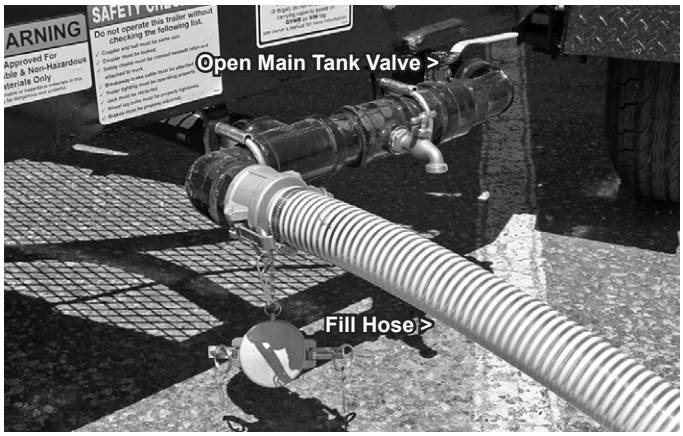


Figure B18
Filling Through Suction Manifold (500/800 Gal.)

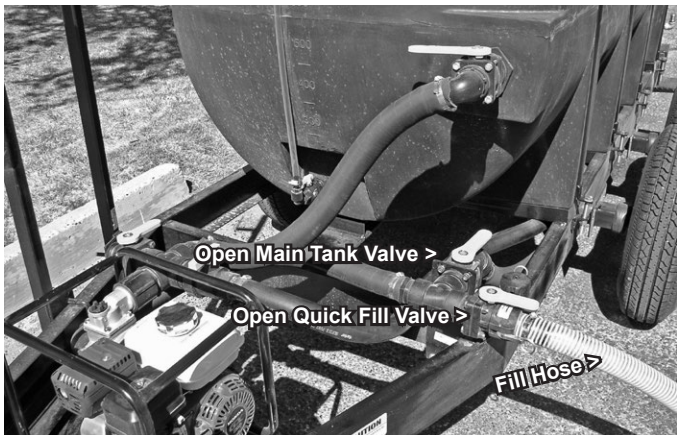


Figure B19
Filling Through Quick Fill (1,025 Gal.)

In order to fill the tank with the transfer pump close the main tank valve and attach the fill hose to the suction manifold (500/800 gal.) or quick-fill coupler (1,025 gal.). Open the bypass valve on the discharge manifold (500/800 gal.) or bypass valve (1,025 gal.). Set the end of the fill hose in the pond, tank or other water source with the suction screen coupled to the end of the hose. Be sure that the suction hose bibb is closed. A partially open bibb will let air into the suction manifold, causing cavitation in the pump and a lack of pressure.

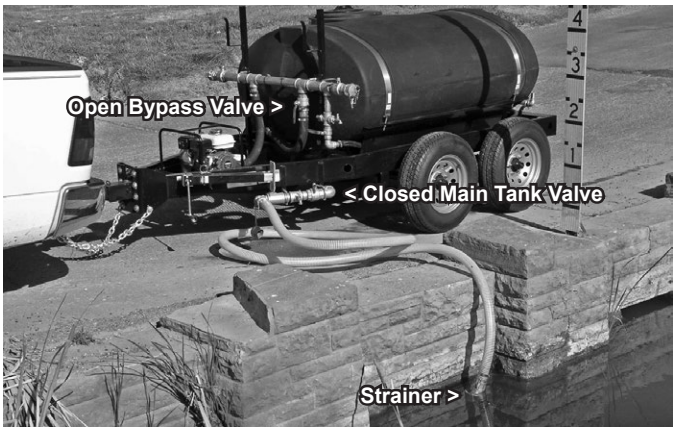


Figure B20
Filling From Open Water (500/800 Gal.)

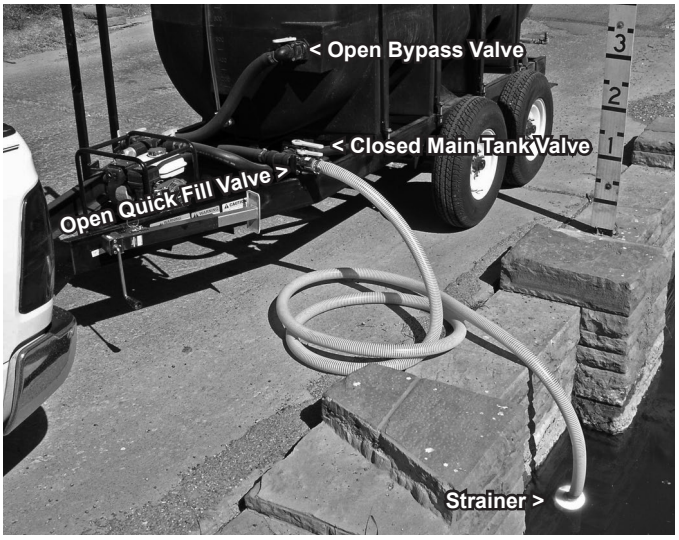


Figure B201Filling From Open Water (1,025 Gal.)

Spray Bar

The Spray Bar is controlled by the spray bar valve. Open the main tank valve and close the bypass valve.

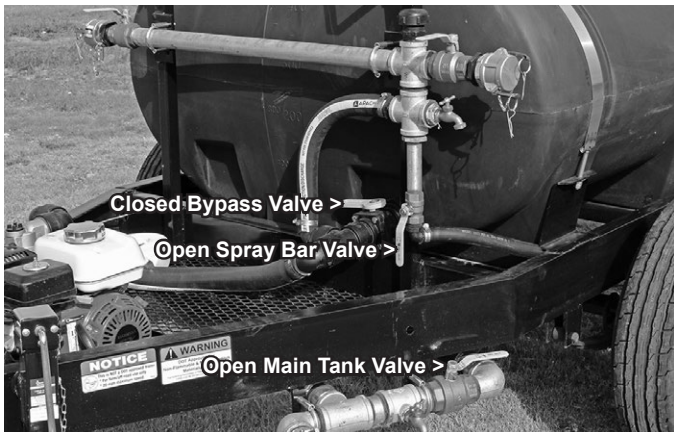


Figure B22
Spray Bar Valve/Bypass Valve Setting

Start the engine and increase to full throttle. Open the spray bar valve. Use the pickup/tractor speed to control the rate that water is applied. The amount of water flowing through the spray bar can be controlled by partially closing the spray bar valve or slightly opening the bypass valve. Do not close the main tank valve. Pump damage can result.

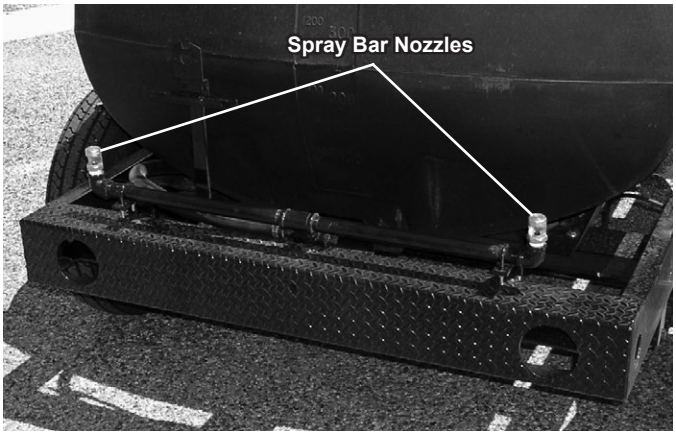


Figure B23
Spray Bar Nozzles (500 Gal.)

The spray bar covers a maximum swath of 25'. Common uses include controlling dust on roads or pre-wetting areas to help prevent spread of fire.

Fire Hose

⚠ WARNING ⚠

Do not direct the spray from the fire hose or pressure hose at electrical connections, boxes or lines. Electrical shock could cause serious bodily injury or death.

The 25' fire hose couples to the fire hose valve on either side of the trailer (500/800 gal.) or above the pump (1,025 gal.). Remove the fire hose coupler cap and quick couple the fire hose. Open the main tank valve, close the bypass and spray bar valves. Open the fire hose valve on the side that the hose is attached.

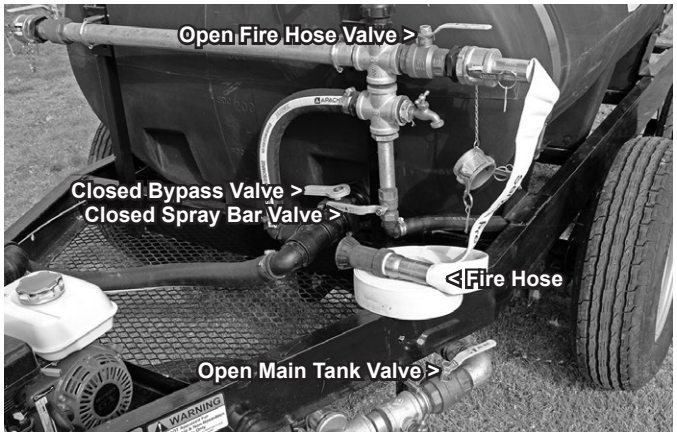


Figure B24
Fire Hose (500/800 Gal.)

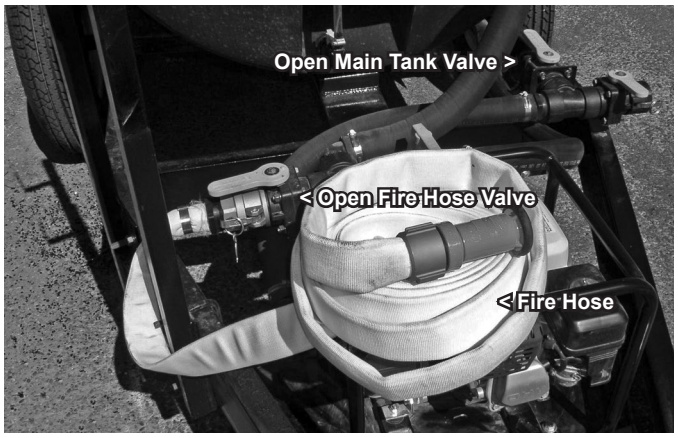


Figure B25
Fire Hose (1,025 Gal.)

The fire hose nozzle can be adjusted for a straight stream or fan spray. Turn the nozzle to the left for a straight stream. Turn the nozzle to the right for a fan or to shut off the flow.

Figure B26
Fire Hose Straight Stream

Figure B27
Fire Hose Fan Spray

Rubber Hose and Nozzle

The 500 and 800 gallon Fire Control Trailer can be equipped with an optional 25' rubber hose and nozzle which is very useful for watering remote vegetation, washdown projects, or supplying cooling water for concrete saws.

Attach the rubber hose to the pressure bibb, open the main tank valve, close the bypass valve and the spray bar valve. Start the engine, open the pressure bibb and squeeze the trigger gun.

Figure B28
Rubber Hose on Pressure Bibb

The rubber hose can be attached to the gravity bibb to supply water for any project needing gravity fed water. Attach the hose to the gravity bibb, open the main tank valve, then open the bibb as needed.

Figure B29
Rubber Hose on Gravity Bibb

Operation -- Arena Express Water Wagon

The 500 and 1,025 gallon Arena Express Water Wagon features a quick-fill valve, fire hose, and spray bar. The spray bar is controlled by a manual ratchet ball valve. The Arena Express Water Wagon is a non-DOT trailer that is not equipped with brakes or lights. It is intended for off-road use with a maximum speed of 20 MPH.

Note: Open the ball valves by turning the handle parallel to the flow. Close the valve by turning the handle perpendicular to the flow.

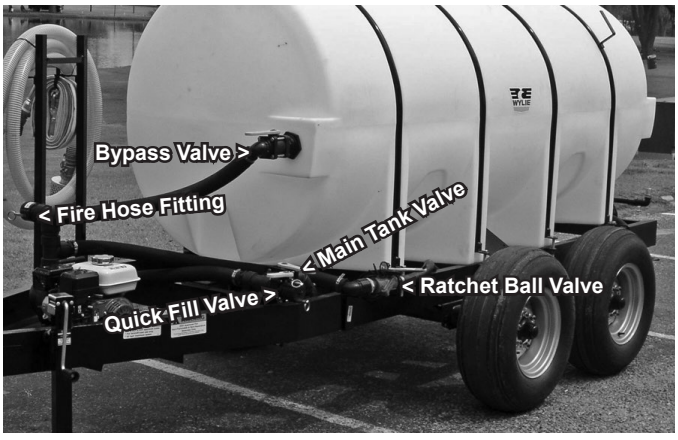


Figure B30
Arena Express Water Wagon Valves

Filling The Tank

The water tank on the Arena Express Water Wagon can be filled by three means: (1) through the tank fillwell (2) through the quick-fill fitting (3) drawing water through the pump.

Before filling through the fillwell, check local codes to see if it is lawful to insert a hose or tube into the tank.

If the tank is to be filled through the suction manifold/ quick-fill fitting, couple the hose to the quick-fill coupler as shown in Figure B29. Open the main tank valve, then open the water source.

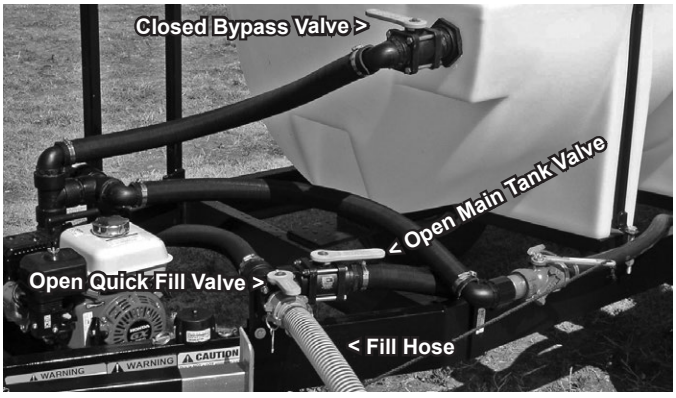


Figure B31
Filling Through Quick-Fill Valve

In order to fill the tank with the transfer pump close the main tank valve and attach the fill hose to the quick-fill coupler. Open the bypass valve. Set the end of the fill hose in the pond, tank or other water source with the suction screen coupled to the end of the hose. Start the pump. If this is the first time to use the pump, it may have to be primed by pouring water through the top of the pump before starting the engine.

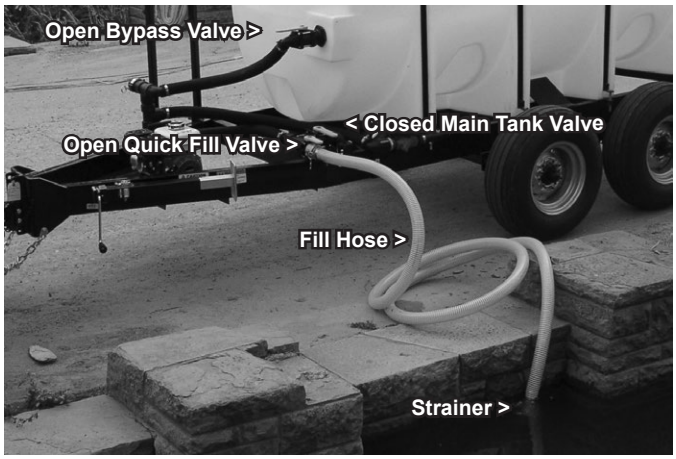


Figure B32
Filling From Open Water Source

Spray Bar

The Spray Bar is controlled by the spray bar valve. The Arena Express spray bar has two spray nozzles.

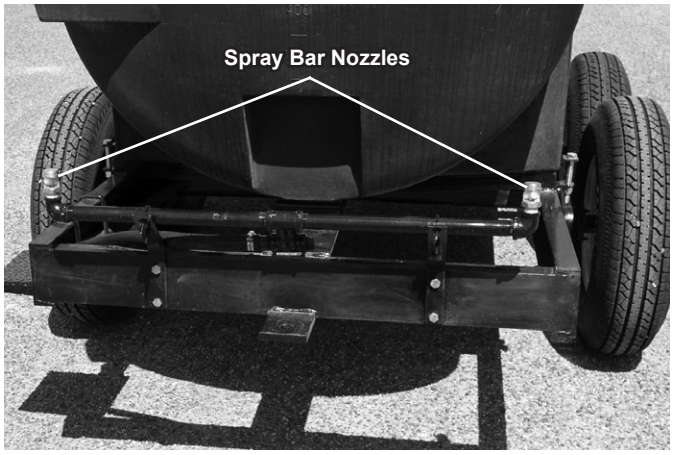


Figure B33
Spray Bar Nozzles

Open the main tank valve and close the bypass valve. Start the engine and increase to full throttle. Open the spray bar valve by pulling the ratchet valve rope. The flag on top of the valve will point in the direction of the flow when the valve is open. Pull the rope again to close the ratchet valve.

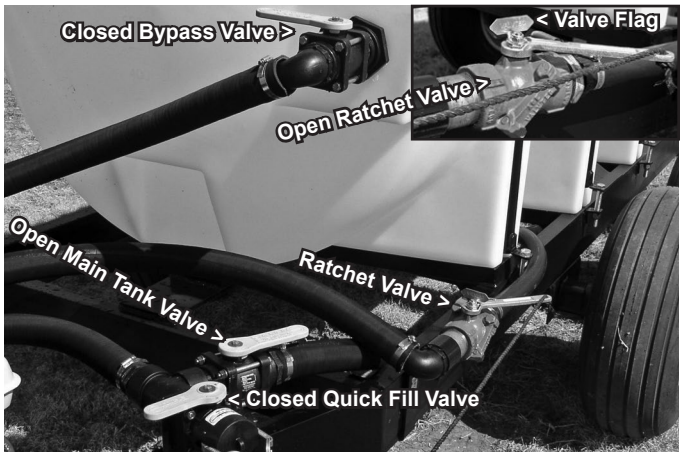


Figure B34
Spray Bar Ratchet Valve

Use the pickup/tractor speed to control the rate that water is applied. The amount of water flowing through the spray bar can be controlled by slightly opening the bypass valve. Do not close the main tank valve. Pump damage can result.

Fire Hose

⚠ WARNING ⚠

Do not direct the spray from the fire hose or pressure hose at electrical connections, boxes or lines.
Electrical shock could cause serious bodily injury or death.

The 25' fire hose couples to the fire hose coupling above the pump. Remove the fire hose coupler cap and quick couple the fire hose. Open the main tank valve, close the bypass and spray bar valves. The fire nozzle adjusts from wide spray to straight stream by rotating the body of the nozzle.

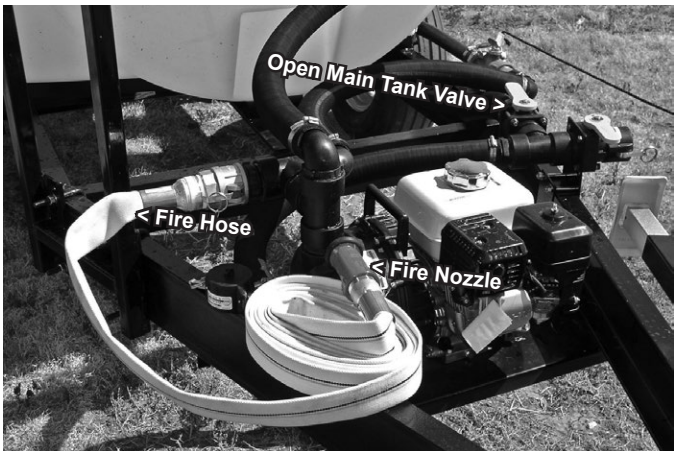


Figure B35
Fire Hose Connection

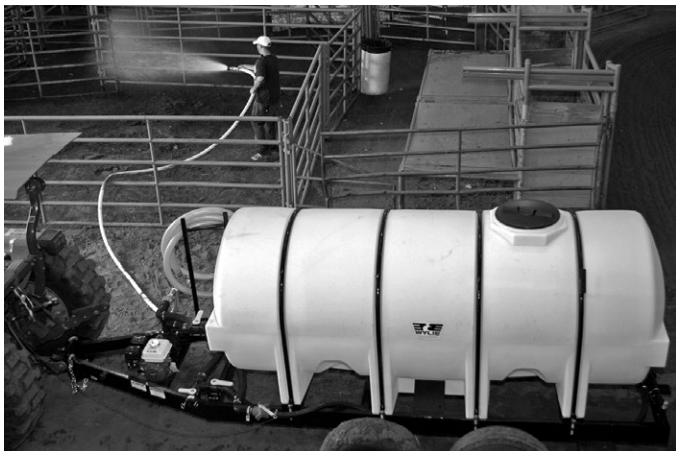


Figure B36
Operating Fire Hose

Maintenance

The “Express” is a low maintenance machine, but will operate much longer if due care is taken on a regular basis. Several times each season the “Express” should be examined for worn hoses, loose fasteners, worn tires, and leaks. Refer to the engine and pump owner’s manual for information regarding maintenance on these components.

From time to time it may be necessary to drain the main tank such as during cold weather. Remove the Quick-Fill cap, open the main tank valve to drain the tank. Remove the pump’s bottom plug to drain the pump. Remove the plug from the spray bar tee to drain the spray bar. For maximum freeze protection, add a few gallons of anti-freeze solution to the tank and circulate through the system.

Figure C1
Main Tank Drain

If water is held for long periods of time in the white tank, algae will grow in the tank. To prevent algae growth, drain the tank when the trailer is not in use. Algae growth can be retarded by adding bleach to the water.

Figure C2
Pump Drain Plug

Lubrication

Check the engine owner's manual for the proper oil to add to the engine.

Some models are equipped with Accu-Lube hubs. If your trailer is equipped with the Accu-Lube system remove the rubber plug and place grease gun (no air powered grease guns) onto the zerk. Pump in new grease until you see the old grease flowing back out of the cap. Wipe off old grease with a towel. Be sure to re-install rubber plug. Service every 12 months or 12,000 miles. Service more often in extremely dusty and/or wet conditions.

Standard hubs should be packed once a year or more often in severe conditions.

Figure C3
Wheel With Accu-Lube Hub

Spray Bar Tip Chart

"210" nozzle is standard

Nozzle Inlet Connection NPT (M)						Capacity Size	Orifice Diam. Nom. Inches	CAPACITY (gallons per minute)									SPRAY ANGLE		
1/8	1/4	3/8	1/2	3/4	1			3 psi	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	7 psi	20 psi	60 psi
●						.25	.016					.03	.035	.04	.05	.06		83°	117°
●						.50	.024					.06	.07	.08	.10	.12		89°	122°
●						.75	.028				.075	.09	.11	.13	.15	.18		106°	125°
●						1	.033				.10	.12	.14	.17	.20	.24		109°	128°
●						1.5	.041			.12	.15	.18	.21	.26	.30	.37	73°	108°	125°
●	●					2	.046			.17	.20	.24	.28	.35	.40	.49	83°	113°	129°
●	●					2.5	.052		.18	.21	.25	.31	.35	.43	.50	.61	98°	122°	133°
●	●					3	.057		.21	.25	.30	.37	.42	.52	.60	.73	86°	112°	126°
●						4	.065		.28	.33	.40	.49	.57	.69	.80	.98	97°	123°	132°
●	●					5	.073	.27	.35	.42	.50	.61	.71	.87	1.0	1.2	114°	128°	142°
●	●					7.5	.091	.41	.53	.63	.75	.92	1.1	1.3	1.5	1.8	101°	119°	134°
●	●					10	.104	.55	.71	.84	1.0	1.2	1.4	1.7	2.0	2.5	115°	133°	145°
●	●					12	.116	.66	.85	1.0	1.2	1.5	1.7	2.1	2.4	2.9	128°	139°	153°
●	●					15	.129	.82	1.1	1.3	1.5	1.8	2.1	2.6	3.0	3.7	98°	113°	123°
●	●					18	.141	.99	1.3	1.5	1.8	2.2	2.5	3.1	3.6	4.4	106°	120°	131°
●	●					20	.148	1.1	1.4	1.7	2.0	2.4	2.8	3.5	4.0	4.9	110°	122°	133°
	●					22	.156	1.2	1.6	1.8	2.2	2.7	3.1	3.8	4.4	5.4	113°	125°	136°
	●					24	.161	1.3	1.7	2.0	2.4	2.9	3.4	4.2	4.8	5.9	115°	131°	144°
	●					27	.173	1.5	1.9	2.3	2.7	3.3	3.8	4.7	5.4	6.6	119°	135°	148°
		●				30	.180	1.6	2.1	2.5	3.0	3.7	4.2	5.1	6.0	7.3	100°	110°	121°
		●				35	.196	1.9	2.5	2.9	3.5	4.3	5.0	6.1	7.0	8.6	105°	118°	128°
		●	●			40	.209	2.2	2.8	3.3	4.0	4.9	5.7	6.9	8.0	9.8	111°	126°	136°
		●				45	.221	2.5	3.2	3.8	4.5	5.5	6.4	7.8	9.0	11.0	115°	130°	140°
			●			50	.238	2.7	3.5	4.2	5.0	6.1	7.0	8.7	10.0	12.3	117°	131°	140°
			●			60	.256	3.3	4.2	5.0	6.0	7.3	8.5	10.4	12.0	14.7	120°	134°	142°
			●			70	.281	3.8	5.0	5.9	7.0	8.6	9.9	12.1	14.0	17.2	123°	137°	146°
			●			80	.297	4.4	5.6	6.7	8.0	9.8	11.3	13.8	16.0	19.6	127°	138°	149°
				●		90	.316	4.9	6.4	7.5	9.0	11.0	12.7	15.6	18.0	20	120°	133°	140°
				●		100	.332	5.5	7.1	8.4	10.0	12.3	14.1	17.3	20	24	123°	136°	145°
				●		110	.348	6.0	7.8	9.2	11.0	13.5	15.6	19.0	22	27	125°	138°	148°
			●	●		120	.368	6.6	8.5	10.0	12.0	14.7	17.0	21	24	29	129°	143°	150°
				●		140	.406	7.7	9.9	11.7	14.0	17.1	19.8	24	28	34	118°	127°	135°
				●		160	.437	8.8	11.3	13.4	16.0	19.6	23	28	32	39	121°	130°	137°
				●		180	.453	10.0	12.7	15.1	18.0	22	25	31	36	44	124°	133°	139°
				●		210	.484	11.5	14.8	17.5	21.0	26	30	36	42	51	128°	139°	145°
					●	300	.578	16.5	21	25	30	37	43	52	60	74	110°	128°	135°
					●	450	.703	25	32	38	45	55	64	78	90	111	118°	132°	138°

Troubleshooting Guidelines

Problem	Cause	Solution
Pump Will Not Operate	(1) Engine not starting or running properly	(1) Refer to engine owner's manual
Pump will not spray solution	(1) Spray tank empty (2) Main tank ball valve closed (3) Malfunctioning pump (4) Proper discharge valve not open	(1) Fill tank (2) Open ball valve (3) See pump owners manual or contact Wylie Spray Center (4) See operation section of manual
Pump output is very low; erratic	(1) Spray tank low; air getting in pump (2) Tank ball valve partially closed (3) Collapsed suction hose (4) Air leak in suction system (5) Malfunctioning pump (6) Engine speed too slow	(1) Fill tank (2) Open ball valve (3) Replace suction hose (4) Tighten fittings; Check for cracked or cut components; Apply thread sealant to pipe threads; Close suction manifold bibb. (5) See pump owners manual or contact Wylie Spray Center (6) Increase engine speed
Gun or nozzles do not operate	(1) Controlling ball valve not open	(1) Open appropriate ball valve
No output or insufficient pressure at spray tip(s)	(1) Air leak in suction side of system (2) Problem with pump (3) Ball valve malfunctioning (4) Bypass valve open	(1) See above (2) See above (3) Repair or replace ball valve (4) Close bypass valve
Spray pattern uneven at one tip	(1) Trash in tip orifice (2) Damaged tip orifice (3) Worn or damaged tip	(1) Clean tip (2), (3) Replace tip

Tire Safety Information

1. TIRE SAFETY INFORMATION

This portion of the User's Manual contains tire safety information as required by 49 CFR 575.6.

Section 2.1 contains "Steps for Determining Correct Load Limit - Trailer".

Section 2.2 contains "Steps for Determining Correct Load Limit – Tow Vehicle".

Section 2.3 contains a Glossary of Tire Terminology, including "cold inflation pressure", "maximum inflation pressure", "recommended inflation pressure", and other non-technical terms.

Section 2.4 contains information from the NHTSA brochure entitled "Tire Safety – Everything Rides On It". This brochure This brochure, as well as the preceding subsections, describes the following items;

- Tire labeling, including a description and explanation of each marking on the tires, and information about the DOT Tire Identification Number (TIN).
- Recommended tire inflation pressure, including a description and explanation of:
  A. Cold inflation pressure.
  B. Vehicle Placard and location on the vehicle.
  C. Adverse safety consequences of under inflation (including tire failure).
  D. Measuring and adjusting air pressure for proper inflation.
- Tire Care, including maintenance and safety practices.
- Vehicle load limits, including a description and explanation of the following items:
  A. Locating and understanding the load limit information, total load capacity, and cargo capacity.
  B. Calculating total and cargo capacities with varying seating configurations including quantitative examples showing / illustrating how the vehicles cargo and luggage capacity decreases as combined number and size of occupants' increases. This item is also discussed in Section 3.
  C. Determining compatibility of tire and vehicle load capabilities.
  D. Adverse safety consequences of overloading on handling and stopping on tires.

1.1. STEPS FOR DETERMINING CORRECT LOAD LIMIT – TRAILER

Determining the load limits of a trailer includes more than understanding the load limits of the tires alone. On all trailers there is a Federal certification/VIN label that is located on the forward half of the left (road) side of the unit. This certification/VIN label will indicate the trailer's Gross Vehicle Weight Rating (GVWR). This is the most weight the fully loaded trailer can weigh. It will also provide the Gross Axle Weight Rating (GAWR). This is the most a particular axle can weigh. If there are multiple axles, the GAWR of each axle will be provided.

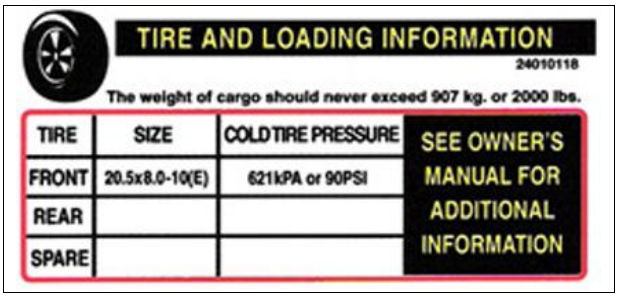
If your trailer has a GVWR of 10,000 pounds or less, there is a vehicle placard located in the same location as the certification label described above. This placard provides tire and loading information. In addition, this placard will show a statement regarding maximum cargo capacity. Cargo can be added to the trailer, up to the maximum weight specified on the placard. The combined weight of the cargo is provided as a single number. In any case, remember: the total weight of a fully loaded trailer can not exceed the stated GVWR.

For trailers with living quarters installed, the weight of water and propane also need to be considered. The weight of fully filled propane containers is considered part of the weight of the trailer before it is loaded with cargo, and is not considered part of the disposable cargo load. Water however, is a disposable cargo weight and is treated as such. If there is a fresh water storage tank of 100 gallons, this tank when filled would weigh about 800 pounds. If more cargo is being transported, water can be off-loaded to keep the total amount of cargo added to the vehicle within the limits of the GVWR so as not to overload the vehicle. Understanding this flexibility will allow you, the owner, to make choices that fit your travel needs.

When loading your cargo, be sure it is distributed evenly to prevent overloading front to back and side to side. Heavy items should be placed low and as close to the axle positions as reasonable. Too many items on one side may overload a tire. The best way to know the actual weight of the vehicle is to weigh it at a public scale. Talk to your dealer to discuss the weighing methods needed to capture the various weights related to the trailer. This would include the weight empty or unloaded, weights per axle, wheel, hitch or king-pin, and total weight.

Excessive loads and/or underinflation cause tire overloading and, as a result, abnormal tire flexing occurs. This situation can generate an excessive amount of heat within the tire. Excessive heat may lead to tire failure. It is the air pressure that enables a tire to support the load, so proper inflation is critical. The proper air pressure may be found on the certification/VIN label and/or on the Tire Placard. This value should never exceed the maximum cold inflation pressure stamped on the tire.

1.1.1. TRAILERS 10,000 POUNDS GVWR OR LESS



Tire and Loading Information Placard – Figure 1-1

1. Locate the statement, "The weight of cargo should never exceed XXX kg or XXX lbs.," on your vehicle's placard. See figure 1-1.
2. This figure equals the available amount of cargo and luggage load capacity.
3. Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage load capacity.

The trailer's placard refers to the Tire Information Placard attached adjacent to or near the trailer's VIN (Certification) label at the left front of the trailer.

1.1.2. TRAILERS OVER 10,000 POUNDS GVWR (NOTE: THESE TRAILERS ARE NOT REQUIRED TO HAVE A TIRE INFORMATION PLACARD ON THE VEHICLE)

1. Determine the empty weight of your trailer by weighing the trailer using a public scale or other means. This step does not have to be repeated.
2. Locate the GVWR (Gross Vehicle Weight Rating) of the trailer on your trailer's VIN (Certification) label.
3. Subtract the empty weight of your trailer from the GVWR stated on the VIN label. That weight is the maximum available cargo capacity of the trailer and may not be safely exceeded.

1.2. STEPS FOR DETERMINING CORRECT LOAD LIMIT – TOW VEHICLE

1. Locate the statement, "The combined weight of occupants and cargo should never exceed XXX lbs.," on your vehicle's placard.
2. Determine the combined weight of the driver and passengers who will be riding in your vehicle.
3. Subtract the combined weight of the driver and passengers from XXX kilograms or XXX pounds.
4. The resulting figure equals the available amount of cargo and luggage capacity. For example, if the "XXX" amount equals 1400 lbs. and there will be five 150 lb. passengers in your vehicle, the amount of available cargo and luggage capacity is 650 lbs. (1400-750 (5 x 150) = 650 lbs.).
5. Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage capacity calculated in Step # 4.
6. If your vehicle will be towing a trailer, load from your trailer will be transferred to your vehicle. Consult the tow vehicle's manual to determine how this weight transfer reduces the available cargo and luggage capacity of your vehicle.

1.3. GLOSSARY OF TIRE TERMINOLOGY

Accessory weight
The combined weight (in excess of those standard items which may be replaced) of automatic transmission, power steering, power brakes, power windows, power seats, radio and heater, to the extent that these items are available as factory-installed equipment (whether installed or not).

Bead
The part of the tire that is made of steel wires, wrapped or reinforced by ply cords and that is shaped to fit the rim.

Bead separation
This is the breakdown of the bond between components in the bead.

Bias ply tire
A pneumatic tire in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90 degrees to the centerline of the tread.

Carcass
The tire structure, except tread and sidewall rubber which, when inflated, bears the load.

Chunking
The breaking away of pieces of the tread or sidewall.

Cold inflation pressure
The pressure in the tire before you drive.

Cord
The strands forming the plies in the tire.

Cord separation
The parting of cords from adjacent rubber compounds.

Cracking
Any parting within the tread, sidewall, or inner liner of the tire extending to cord material.

CT
A pneumatic tire with an inverted flange tire and rim system in which the rim is designed with rim flanges pointed radially inward and the tire is designed to fit on the underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire.

Curb weight
The weight of a motor vehicle with standard equipment including the maximum capacity of fuel, oil, and coolant, and, if so equipped, air conditioning and additional weight optional engine.

Extra load tire
A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

Groove
The space between two adjacent tread ribs.

Gross Axle Weight Rating
The maximum weight that any axle can support, as published on the Certification / VIN label on the front left side of the trailer. Actual weight determined by weighing each axle on a public scale, with the trailer attached to the towing vehicle.

Gross Vehicle Weight Rating
The maximum weight of the fully loaded trailer, as published on the Certification / VIN label. Actual weight determined by weighing trailer on a public scale, without being attached to the towing vehicle.

Hitch Weight
The downward force exerted on the hitch ball by the trailer coupler.

Innerliner
The layer(s) forming the inside surface of a tubeless tire that contains the inflating medium within the tire.

Innerliner separation
The parting of the innerliner from cord material in the carcass.

Intended outboard sidewall
The sidewall that contains a white-wall, bears white lettering or bears manufacturer, brand, and/or model name molding that is higher or deeper than the same molding on the other sidewall of the tire or the outward facing sidewall of an asymmetrical tire that has a particular side that must always face outward when mounted on a vehicle.

Light truck (LT) tire
A tire designated by its manufacturer as primarily intended for use on lightweight trucks or multipurpose passenger vehicles.

Load rating
The maximum load that a tire is rated to carry for a given inflation pressure.

Maximum load rating
The load rating for a tire at the maximum permissible inflation pressure for that tire.

Maximum permissible inflation pressure
The maximum cold inflation pressure to which a tire may be inflated.

Maximum loaded vehicle weight
The sum of curb weight, accessory weight, vehicle capacity weight, and production options weight.

Measuring rim
The rim on which a tire is fitted for physical dimension requirements.

Pin Weight
The downward force applied to the 5th wheel or gooseneck ball, by the trailer kingpin or gooseneck coupler.

Non-pneumatic rim
A mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

Non-pneumatic spare tire assembly
A non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

Non-pneumatic tire
A mechanical device which transmits, either directly or through a wheel or wheel center member, the vertical load and tractive forces from the roadway to the vehicle, generates the tractive forces that provide the directional control of the vehicle and does not rely on the containment of any gas or fluid for providing those functions.

Non-pneumatic tire assembly
A non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

Normal occupant weight
This means 68 kilograms (150 lbs.) times the number of occupants specified in the second column of Table I of 49 CFR 571.110.

Occupant distribution
The distribution of occupants in a vehicle as specified in the third column of Table I of 49 CFR 571.110.

Open splice
Any parting at any junction of tread, sidewall, or innerliner that extends to cord material.

Outer diameter
The overall diameter of an inflated new tire.

Overall width

The linear distance between the exteriors of the sidewalls of an inflated tire, including elevations due to labeling, decorations, or protective bands or ribs.

Ply
A layer of rubber-coated parallel cords.

Ply separation
A parting of rubber compound between adjacent plies.

Pneumatic tire
A mechanical device made of rubber, chemicals, fabric and steel or other materials, that, when mounted on an automotive wheel, provides the traction and contains the gas or fluid that sustains the load.

Production options weight
The combined weight of those installed regular production options weighing over 2.3 kilograms (5 lbs.) in excess of those standard items which they replace, not previously considered in curb weight or accessory weight, including heavy duty brakes, ride levelers, roof rack, heavy duty battery, and special trim.

Radial ply tire
A pneumatic tire in which the ply cords that extend to the beads are laid at substantially 90 degrees to the centerline of the tread.

Recommended inflation pressure
This is the inflation pressure provided by the vehicle manufacturer on the Tire Information label and on the Certification / VIN tag.

Reinforced tire
A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

Rim
A metal support for a tire or a tire and tube assembly upon which the tire beads are seated.

Rim diameter
This means the nominal diameter of the bead seat.

Rim size designation
This means the rim diameter and width.

Rim type designation
This means the industry of manufacturer's designation for a rim by style or code.

Rim width
This means the nominal distance between rim flanges.

Section width
The linear distance between the exteriors of the sidewalls of an inflated tire, excluding elevations due to labeling, decoration, or protective bands.

Sidewall
That portion of a tire between the tread and bead.

Sidewall separation
The parting of the rubber compound from the cord material in the sidewall.

Special Trailer (ST) tire
The "ST" is an indication the tire is for trailer use only.

Test rim
The rim on which a tire is fitted for testing, and may be any rim listed as appropriate for use with that tire.

Tread

That portion of a tire that comes into contact with the road.

Tread rib
A tread section running circumferentially around a tire.

Tread separation
Pulling away of the tread from the tire carcass.

Treadwear indicators (TWI)
The projections within the principal grooves designed to give a visual indication of the degrees of wear of the tread.

Vehicle capacity weight
The rated cargo and luggage load plus 68 kilograms (150 lbs.) times the vehicle's designated seating capacity.

Vehicle maximum load on the tire
The load on an individual tire that is determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing by two.

Vehicle normal load on the tire
The load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and normal occupant weight (distributed in accordance with Table I of CRF 49 571.110) and dividing by 2.

Weather side
The surface area of the rim not covered by the inflated tire.

Wheel center member
In the case of a non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic rim and provides the connection between the non-pneumatic rim and the vehicle; or, in the case of a non-pneumatic tire assembly not incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic tire and provides the connection between tire and the vehicle.

Wheel-holding fixture
The fixture used to hold the wheel and tire assembly securely during testing.

1.4. TIRE SAFETY - EVERYTHING RIDES ON IT

The National Traffic Safety Administration (NHTSA) has published a brochure (DOT HS 809 361) that discusses all aspects of Tire Safety, as required by CFR 575.6. This brochure is reproduced in part below. It can be obtained and downloaded from NHTSA, free of charge, from the following web site:

http://www.nhtsa.dot.gov/cars/rules/TireSafety/ridesonit/tires_index.html

Studies of tire safety show that maintaining proper tire pressure, observing tire and vehicle load limits (not carrying more weight in your vehicle than your tires or vehicle can safely handle), avoiding road hazards, and inspecting tires for cuts, slashes, and other irregularities are the most important things you can do to avoid tire failure, such as tread separation or blowout and flat tires. These actions, along with other care and maintenance activities, can also:

- Improve vehicle handling
- Help protect you and others from avoidable breakdowns and accidents
- Improve fuel economy
- Increase the life of your tires.

This booklet presents a comprehensive overview of tire safety, including information on the following topics:
- Basic tire maintenance
- Uniform Tire Quality Grading System
- Fundamental characteristics of tires

- Tire safety tips.

Use this information to make tire safety a regular part of your vehicle maintenance routine. Recognize that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.

1.5. SAFETY FIRST–BASIC TIRE MAINTENANCE

Properly maintained tires improve the steering, stopping, traction, and load-carrying capability of your vehicle. Underinflated tires and overloaded vehicles are a major cause of tire failure. Therefore, as mentioned above, to avoid flat tires and other types of tire failure, you should maintain proper tire pressure, observe tire and vehicle load limits, avoid road hazards, and regularly inspect your tires.

1.5.1. FINDING YOUR VEHICLE'S RECOMMENDED TIRE PRESSURE AND LOAD LIMITS

Tire information placards and vehicle certification labels contain information on tires and load limits. These labels indicate the vehicle manufacturer's information including:

- Recommended tire size
- Recommended tire inflation pressure
- Vehicle capacity weight (VCW–the maximum occupant and cargo weight a vehicle is designed to carry)
- Front and rear gross axle weight ratings (GAWR– the maximum weight the axle systems are designed to carry).

Both placards and certification labels are permanently attached to the trailer near the left front.

1.5.2. UNDERSTANDING TIRE PRESSURE AND LOAD LIMITS

Tire inflation pressure is the level of air in the tire that provides it with load-carrying capacity and affects the overall performance of the vehicle. The tire inflation pressure is a number that indicates the amount of air pressure– measured in pounds per square inch (psi)–a tire requires to be properly inflated. (You will also find this number on the vehicle information placard expressed in kilopascals (kpa), which is the metric measure used internationally.)

Manufacturers of passenger vehicles and light trucks determine this number based on the vehicle's design load limit, that is, the greatest amount of weight a vehicle can safely carry and the vehicle's tire size. The proper tire pressure for your vehicle is referred to as the "recommended cold inflation pressure." (As you will read below, it is difficult to obtain the recommended tire pressure if your tires are not cold.)
Because tires are designed to be used on more than one type of vehicle, tire manufacturers list the "maximum permissible inflation pressure" on the tire sidewall. This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

1.5.3. CHECKING TIRE PRESSURE

It is important to check your vehicle's tire pressure at least once a month for the following reasons:

- Most tires may naturally lose air over time.
- Tires can lose air suddenly if you drive over a pothole or other object or if you strike the curb when parking.
- With radial tires, it is usually not possible to determine underinflation by visual inspection.

For convenience, purchase a tire pressure gauge to keep in your vehicle. Gauges can be purchased at tire dealerships, auto supply stores, and other retail outlets.
The recommended tire inflation pressure that vehicle manufacturers provide reflects the proper psi when a tire is cold. The term cold does not relate to the outside temperature. Rather, a cold tire is one that has not been driven on for at least three hours. When you drive, your tires get warmer, causing the air pressure within them to increase. Therefore, to get an accurate tire pressure reading, you must measure tire pressure when the tires are cold or compensate for the extra pressure in warm tires.

1.5.4. Steps for Maintaining Proper Tire Pressure

- Step 1: Locate the recommended tire pressure on the vehicle's tire information placard, certification label, or in the owner's manual.
- Step 2: Record the tire pressure of all tires.
- Step 3: If the tire pressure is too high in any of the tires, slowly release air by gently pressing on the tire valve stem with the edge of your tire gauge until you get to the correct pressure.
- Step 4: If the tire pressure is too low, note the difference between the measured tire pressure and the correct tire pressure. These "missing" pounds of pressure are what you will need to add.
- Step 5: At a service station, add the missing pounds of air pressure to each tire that is underinflated.
- Step 6: Check all the tires to make sure they have the same air pressure (except in cases in which the front and rear tires are supposed to have different amounts of pressure).

If you have been driving your vehicle and think that a tire is underinflated, fill it to the recommended cold inflation pressure indicated on your vehicle's tire information placard or certification label. While your tire may still be slightly underinflated due to the extra pounds of pressure in the warm tire, it is safer to drive with air pressure that is slightly lower than the vehicle manufacturer's recommended cold inflation pressure than to drive with a significantly underinflated tire. Since this is a temporary fix, don't forget to recheck and adjust the tire's pressure when you can obtain a cold reading.

1.5.5. Tire Size

To maintain tire safety, purchase new tires that are the same size as the vehicle's original tires or another size recommended by the manufacturer. Look at the tire information placard, the owner's manual, or the sidewall of the tire you are replacing to find this information. If you have any doubt about the correct size to choose, consult with the tire dealer.

1.5.6. Tire Tread

The tire tread provides the gripping action and traction that prevent your vehicle from slipping or sliding, especially when the road is wet or icy. In general, tires are not safe and should be replaced when the tread is worn down to 1/16 of an inch. Tires have built-in treadwear indicators that let you know when it is time to replace your tires. These indicators are raised sections spaced intermittently in the bottom of the tread grooves. When they appear "even" with the outside of the tread, it is time to replace your tires. Another method for checking tread depth is to place a penny in the tread with Lincoln's head upside down and facing you. If you can see the top of Lincoln's head, you are ready for new tires.

1.5.7. Tire Balance and Wheel Alignment

To avoid vibration or shaking of the vehicle when a tire rotates, the tire must be properly balanced. This balance is achieved by positioning weights on the wheel to counterbalance heavy spots on the wheel-and-tire assembly. A wheel alignment adjusts the angles of the wheels so that they are positioned correctly relative to the vehicle's frame. This adjustment maximizes the life of your tires. These adjustments require special equipment and should be performed by a qualified technician.

1.5.8. Tire Repair

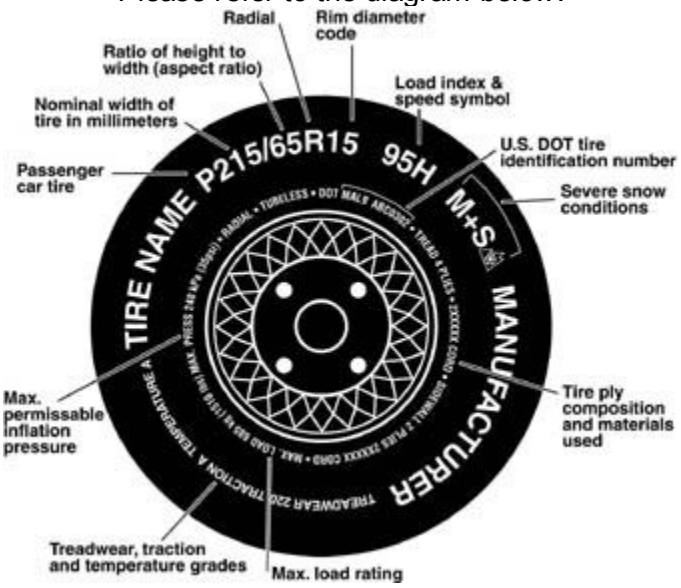
The proper repair of a punctured tire requires a plug for the hole and a patch for the area inside the tire that surrounds the puncture hole. Punctures through the tread can be repaired if they are not too large, but punctures to the sidewall should not be repaired. Tires must be removed from the rim to be properly inspected before being plugged and patched.

1.5.9. Tire Fundamentals

Federal law requires tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire and also provides a tire identification number for safety standard certification and in case of a recall.

1.5.9.1. Information on Passenger Vehicle Tires

Please refer to the diagram below.



P
The "P" indicates the tire is for passenger vehicles.

Next number
This three-digit number gives the width in millimeters of the tire from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.

Next number
This two-digit number, known as the aspect ratio, gives the tire's ratio of height to width. Numbers of 70 or lower indicate a short sidewall for improved steering response and better overall handling on dry pavement.

R
The "R" stands for radial. Radial ply construction of tires has been the industry standard for the past 20 years.

Next number
This two-digit number is the wheel or rim diameter in inches. If you change your wheel size, you will have to purchase new tires to match the new wheel diameter.

Next number
This two- or three-digit number is the tire's load index. It is a measurement of how much weight each tire can support. You may find this information in your owner's manual. If not, contact a local tire dealer. Note: You may not find this information on all tires because it is not required by law.

M+S
The "M+S" or "M/S" indicates that the tire has some mud and snow capability. Most radial tires have these markings; hence, they have some mud and snow capability.

Speed Rating
The speed rating denotes the speed at which a tire is designed to be driven for extended periods of time. The ratings range from 99 miles per hour (mph) to 186 mph. These ratings are listed below. Note: You may not find this information on all tires because it is not required by law.

Tire Safety Information

Letter Rating	Speed Rating
Q	99 mph
R	106 mph
S	112 mph
T	118 mph
U	124 mph
H	130 mph
V	149 mph
W	168* mph
Y	186* mph

* For tires with a maximum speed capability over 149 mph, tire manufacturers sometimes use the letters ZR. For those with a maximum speed capability over 186 mph, tire manufacturers always use the letters ZR.

U.S. DOT Tire Identification Number
This begins with the letters "DOT" and indicates that the tire meets all federal standards. The next two numbers or letters are the plant code where it was manufactured, and the last four numbers represent the week and year the tire was built. For example, the numbers 3197 means the 31st week of 1997. The other numbers are marketing codes used at the manufacturer's discretion. This information is used to contact consumers if a tire defect requires a recall.

Tire Ply Composition and Materials Used
The number of plies indicates the number of layers of rubber-coated fabric in the tire. In general, the greater the number of plies, the more weight a tire can support. Tire manufacturers also must indicate the materials in the tire, which include steel, nylon, polyester, and others.

Maximum Load Rating
This number indicates the maximum load in kilograms and pounds that can be carried by the tire.

Maximum Permissible Inflation Pressure
This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

1.5.9.2. UTQGS Information

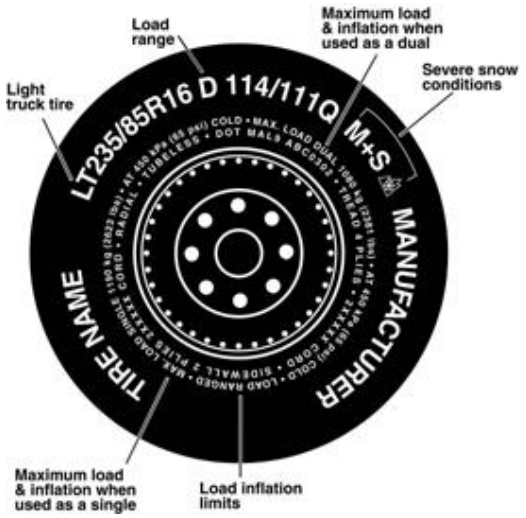
Treadwear Number
This number indicates the tire's wear rate. The higher the treadwear number is, the longer it should take for the tread to wear down. For example, a tire graded 400 should last twice as long as a tire graded 200.

Traction Letter
This letter indicates a tire's ability to stop on wet pavement. A higher graded tire should allow you to stop your car on wet roads in a shorter distance than a tire with a lower grade. Traction is graded from highest to lowest as "AA","A", "B", and "C".

Temperature Letter
This letter indicates a tire's resistance to heat. The temperature grade is for a tire that is inflated properly and not overloaded. Excessive speed, underinflation or excessive loading, either separately or in combination, can cause heat build-up and possible tire failure. From highest to lowest, a tire's resistance to heat is graded as "A", "B", or "C".

1.5.9.3. Additional Information on Light Truck Tires

Please refer to the following diagram.



Tires for light trucks have other markings besides those found on the sidewalls of passenger tires.

LT
The "LT" indicates the tire is for light trucks or trailers.

ST
An "ST" is an indication the tire is for trailer use only.

Max. Load Dual kg (lbs) at kPa (psi) Cold
This information indicates the maximum load and tire pressure when the tire is used as a dual, that is, when four tires are put on each rear axle (a total of six or more tires on the vehicle).

Max. Load Single kg (lbs) at kPa (psi) Cold
This information indicates the maximum load and tire pressure when the tire is used as a single.

Load Range
This information identifies the tire's load-carrying capabilities and its inflation limits.

1.6. TIRE SAFETY TIPS

Preventing Tire Damage

- Slow down if you have to go over a pothole or other object in the road.
- Do not run over curbs or other foreign objects in the roadway, and try not to strike the curb when parking.

Tire Safety Checklist

- Check tire pressure regularly (at least once a month), including the spare.
- Inspect tires for uneven wear patterns on the tread, cracks, foreign objects, or other signs of wear or trauma.
- Remove bits of glass and foreign objects wedged in the tread.
- Make sure your tire valves have valve caps.
- Check tire pressure before going on a long trip.
- Do not overload your vehicle. Check the Tire Information and Loading Placard or User's Manual for the maximum recommended load for the vehicle.

Notes